

What you need to know in using psychotropic drugs



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เนื้อหา

1. บทบาทของพยาบาลทางจิตเวช
2. เกสัชวิทยาของยาโรคจิต
2. เกสัชวิทยาของยาซึมเศร้า
3. เกสัชวิทยาของยากดประสาท
4. เกสัชวิทยาของยาจิตเวช/ยานอนหลับ

บทบาทของพยาบาลทางจิตเวช

- ♦ Role of the nurse in administration and safe administration
- ♦ PRN medication
- ♦ Role of the multidisciplinary team

The 6 rights

- ♦ 1. Right drug
- ♦ 2. Right individual
- ♦ 3. Right dose
- ♦ 4. Right time
- ♦ 5. Right route
- ♦ 6. Right indication.

Role of the nurse

What nurses need to know;

- Sound working knowledge of psychotropic medication
- Sound working knowledge of neurochemistry
- Awareness of the symptoms that particular drugs target
- The correct identification of these symptoms
- Side effects and management

Education

- ♦ Possibly to biggest part of nurses role besides administration.
- ♦ Every time you administer medication you should be educating the client on;
 - ♦ What it is for? What it does?
 - ♦ The expected benefits and potential risks?
 - ♦ Common side effects and management
 - ♦ Include the family

PRN medication

- The need to reduce agitation, distress or aggression rapidly often results in the prescription of PRN(as needed) medication.
- Generally only needed for short periods
- The nurse generally needed to make decisions regarding a range of;
 - Medications
 - Doses
 - How and when to deliver

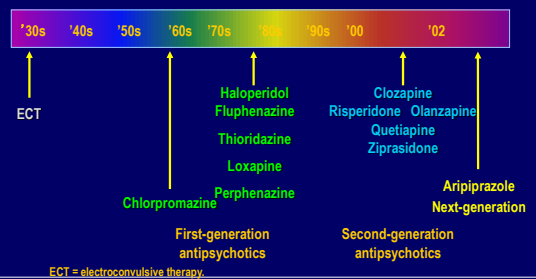
Role of multidisciplinary team

- ♦ Multidisciplinary teams are considered routine in the provision of mental health care
- ♦ Disciplines include;
 - Nurses
 - Psychiatrists
 - Psychologists
 - Social workers
 - Occupational therapists

Psychopharmacotherapy

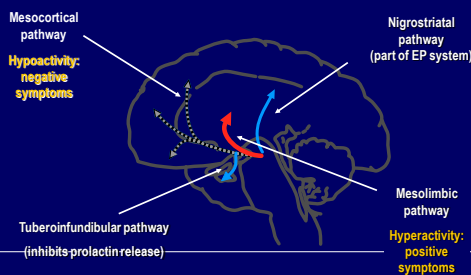
- ♦ Antipsychotic drugs
- ♦ Antidepressant drugs
- ♦ Mood stabilizing drugs
- ♦ Antianxiety or anxiolytic drugs

Developments in Medical Treatments for Psychotic Disorders



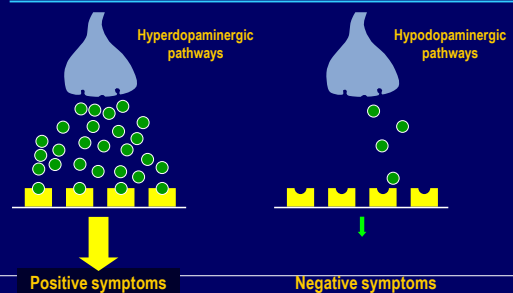
Kapur and Remington. *Ann Rev Med.* 2001;52:503.
 Worrel et al. *Am J Health Syst Pharm.* 2000;57:238.

Dopamine Hypothesis of Schizophrenia



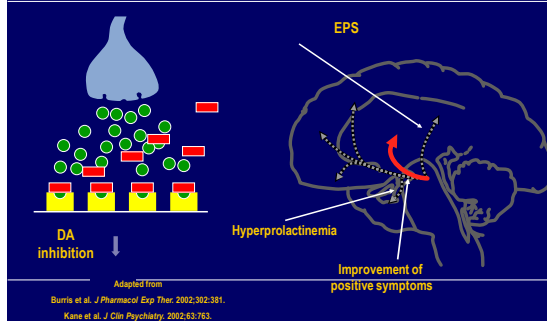
Adapted from Inoue and Nakata. *Jpn J Pharmacol.* 2001;86:376.

Dopamine Hypothesis of Schizophrenia

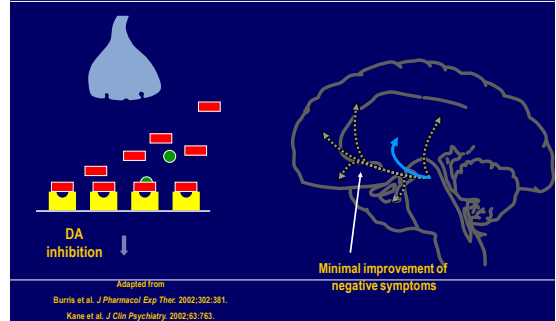


Adapted from Stahl. *J Clin Psychiatry.* 2001;62:842.

Dopamine Antagonism: Positive Symptoms and Side Effects

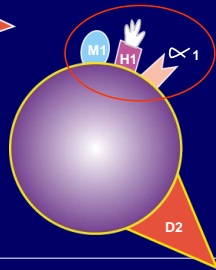


Dopamine Antagonism: Negative Symptoms



pure D2 blocker

Conventional antipsychotic drug



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EPS- Acute dystonia

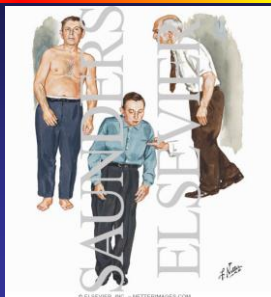


Symptoms may include:

- ❑ Blepharospasm [eye closing]
- ❑ Torticollis [neck muscle contraction – pulling head to side]
- ❑ Oculogyric Crisis [severe upward deviation of eyeballs]
- ❑ Opisthotonos [severe dorsal arching of neck and back]
- ❑ Laryngospasm [involvement of tongue (dysphasia- difficulty swallowing)]

EPS –Parkinsonism symptoms

- ❑ Tremors
- ❑ Bradykinesia/akinesia [slowness, absence of movement]
- ❑ Cogwheel rigidity [slow regular muscular jerks]
- ❑ Postural instability
- ❑ Stooped/hunched posture
- ❑ Shuffling gait
- ❑ Restricted movements
- ❑ Masked face [loss of mobility in facial muscles]
- ❑ Hypersalivation & drooling



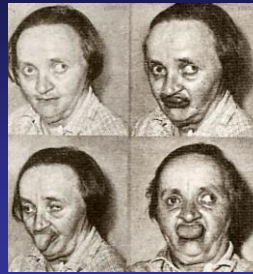
EPS – Akathisia symptoms

- AKATHISIA – “not sitting”
 - ❖ Pacing, Motor restlessness, Rocking, Foot taping
 - ❖ Subjective c/o inner restlessness, irritability, inability to sit still or lie down.
 - ❖ Need to differentiate between Akathisia and psychomotor agitation or restlessness

Neuroleptic Malignant Syndrome

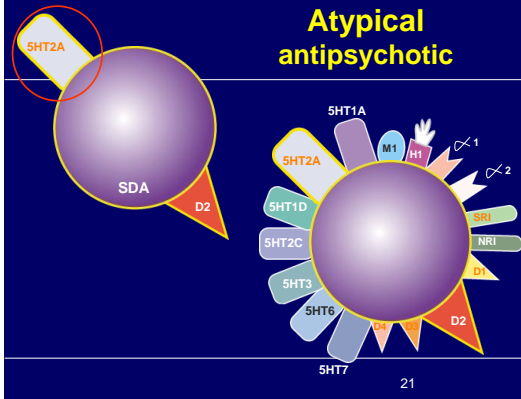
- A rare but potentially fatal complication of treatment with neuroleptic drugs.
- Can occur within first 2 weeks of use
- Increased risk with high dose-high potency drugs, concurrent medical conditions (dehydration, poor nutrition)
- Assessment – check elevation of B/P, high fever (hyperpyrexia), rigidity, diaphoresis, pallor, delirium
- LABS – elevated CPK (creatinine phosphokinase)

TARDIVE DYSKINESIA (late occurring abnormal movements)



- Effects 4% of persons taking antipsychotics
- Choreoathetoid movements (rapid, jerky and slow, writhing movements) may occur anywhere in the body – arms, feet, legs, trunk
- Classic description – oral, buccal, lingual, & masticatory movements [tongue thrusting, lip pursing & smacking, facial grimaces and chewing movements].

Atypical antipsychotic



The correlation between receptor-binding profiles and side effects for a series of antipsychotic medications

Drug name	Receptor binding						Side effects			
	D ₁	D ₂	5-HT _{2A}	α-1	ACh	Hist	EPS	Prolactin	Weight gain	Sedation
Haloperidol	-	+++	+	+	-	-	+++	+++	+	+
Amisulpride	-	+++	-	-	-	-	++(+)	+++	+	+
Aripiprazole	N/A	++(+)	+++	+	+	+	+	+	+	+
Clozapine	++	++	++	+++	+++	++	-	-	+++	+++
Olanzapine	+	++	++	++	+++	++	+	+	+++	++
Quetiapine	-	++(+)	++	++	-	++	-	-	++(+)	++
Risperidone	-	+++	+++	++	-	(+)	++(+)	++	++(+)	+
Ziprasidone	-	++	+++	++	+	(+)	+	+	+	++

++ = very high / severe, ++ = moderate, + = weak / mild, - = none
N/A = not available

Adapted from Gerlach 2002

Side effects of atypical antipsychotic drugs

Weight Gain
Mean weight gain in patients with atypical antipsychotics over a 52-week period:
- 4.0 kg with risperidone,
- 4.15 kg with ziprasidone,
- 2.52 kg with quetiapine,
- 2.52 kg with risperidone,
- 2.52 kg with ziprasidone.

Cataracts
Some drugs may be associated with an increased risk of cataracts (clouding of the lens). Patients with cataracts often have risk factors for eye diseases, such as Diabetes, hypertension and poor nutrition.

Sexual side effects
Antipsychotic-induced sexual dysfunction is related to the effects of the drug on dopamine D₂ and alpha-1 adrenergic receptors. In addition, the blockade of D₂ receptors in the hypothalamus, which leads to an increase of prolactin secretion.

Hyperlipidemia
A high concentration of lipid in the blood, an increased risk for cardiovascular disease due to the influence on atherosclerosis.

Diabetes Mellitus
The prevalence of Type 2 DM is greatly increased in patients with atypical antipsychotics. This is due to the effect of the drug on the insulin resistance. Mean of these studies indicate that drug treatment with atypical antipsychotics is a risk factor for insulin death.

Extrapyramidal symptoms
Neuroleptic-induced, extrapyramidal symptoms (involuntary movements and akathisia (inability to remain motionless)).

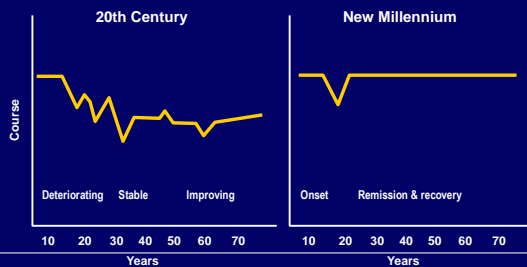
QTc Interval
QTc interval is the time between the start of the Q wave and the end of the T wave in the heart's electrical cycle. A prolonged QTc interval is a marker for ventricular tachycardia and a risk factor for sudden death.

Myocarditis
Inflammation of the heart muscle. It can cause a mild disease without any symptoms that resolves itself, or it may cause chest pain, heart failure, or sudden death.

Long acting anti-psychotics

- Indicated mainly for patients with low compliance to treatment
- IM:
 - Haloperidol - Halidol decanoas
 - Fluphenazine – Modiket
 - Zuclopenthixol – Clopixol depot
 - Flupenthixol – Fluanxol depot
 - Risperidone – Risperidal consta
 - Palliperidone – Invega Sustenna

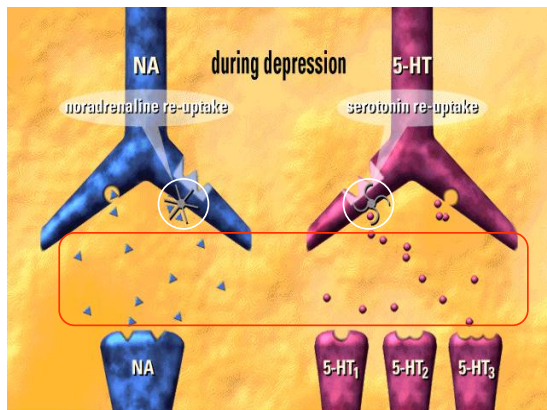
Course of schizophrenia & related psychotic disorders



Depression—Common Treatment Options

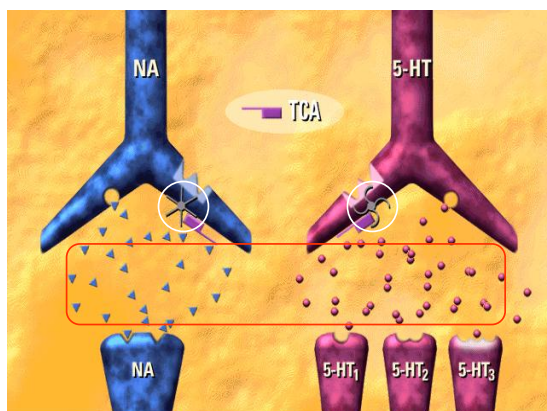
Antidepressant medications	Selective serotonin reuptake inhibitors (SSRIs) Other antidepressants (selective norepinephrine reuptake inhibitors [SNRIs], atypicals, Melatonergic) Tricyclic antidepressants (TCAs) Monoamine oxidase inhibitors (MAOIs)
Psychotherapies	Cognitive therapy Behavioral therapy Interpersonal therapy Psychoanalytically oriented therapy Family therapy
Combined medication/psychotherapy	
Other	Electroconvulsive therapy Phototherapy (light therapy) Hospitalization

MS America February 2003; Sadock and Sadock 2003; Depression in Primary Care 2 (AMCP), 1995.



กลไกการออกฤทธิ์

- ◆ ยาแก้เศร้ากลุ่ม tricyclic ออกฤทธิ์โดยการยับยั้ง reuptake ของ monoamine กลับสู่ presynaptic neuron ทำให้ปริมาณของ norepinephrine และ serotonin เพิ่มขึ้นที่บริเวณ synapse
- ◆ ก่อให้เกิด Down regulation ที่ post synaptic site

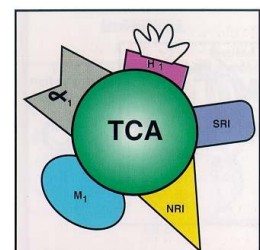


กลไกการออกฤทธิ์ของ TCAs

- ที่ให้ **therapeutic effects**

คือ **block reuptake** ของ
5HT และ NE

- ที่ให้ **side effect** คือ การ จับ
กับ H1, M1, alpha 1
receptors



TCA

Side effects associated with receptor blockade

Muscarinic	Histaminergic	α_1 -adrenergic
dry mouth	sedation	drowsiness
constipation	weight gain	dizziness
urinary hesitance	drowsiness	postural hypotension
blurred vision		reflex tachycardia
dizziness		
memory disturbance		
tachycardia		



ข้อห้ามและภาวะที่ควรระวังในการใช้ TCA

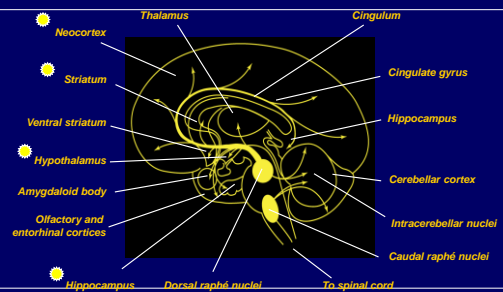
- 1) Narrow angle glaucoma
- 2) Recent myocardial infarction, ภาวะ conduction abnormality โดยเฉพาะ AV-Block grade III, bundle branch block หรือ prolong QT interval
- 3) Delirium
- 4) Benign prostate hypertrophy
- 5) ผู้ป่วยตั้งครรภ์และให้นมบุตร เนื่องจากผ่านรกและน้ำนมได้



Selective Serotonin Reuptake Inhibitors (SSRI)

- Fluoxetine, Fluvoxamine, Paroxetine, Citalopam, Sertraline, Escitalopam

Serotonergic innervation of the CNS



Kaplan & Sadok. In: Synopsis of Psychiatry, Behavioral Sciences, Clinical Psychiatry, 6th ed. Revised. 1991

SSRIs pharmacological (therapeutic) profile :

- 1. From midbrain raphe to **prefrontal cortex** (antidepressant)
- 2. From midbrain raphe to **basal ganglia** (anti-OCD)
- 3. From midbrain raphe to **limbic cortex & hippocampus** (anti-panic)
- 4. From midbrain raphe to **hypothalamus** (anti-bulimia)



Cytochrome P450 and psychotropics

- Cytochrome P450 enzymes ที่ตับใช้ในการ metabolize ยาต่าง ๆ
- ที่สำคัญ 4 ชนิด
- CYP 1 A 2
- CYP 2 D 6
- CYP 3 A 3,4
- CYP 2 C 19

Drug Interactions at Usual Effective Doses

Inhibitory effect of select antidepressants on specific cytochrome P450 isoenzymes

	1A2	2C9/10	2C19	2D6	3A3/4
Citalopram*	•	•	•	+	•
Escitalopram*	•	•	•	++	•
Flooxetine*	•	+++	++	+++	+
Nefazodone*	•	•	•	•	+++
Paroxetine*	•	•	•	+++	•
Venlafaxine*	•	•	•	+	•
Sertraline*	•	•	•	+	•

* no or minimal effect (<20%)

• mild effect (20%-50%)

--- moderate effect (50%-100%)

+++ substantial effect (>100%)

*Manufacturer's product information 2003.

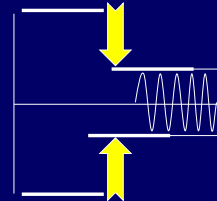
*There is increased plasma level of co-administered drug dependent on the CYP enzyme inhibited.

Sertraline has the potential for clinically important 2D6 inhibition. Consequently, co-administration of a drug metabolized by P450 2D6 with sertraline may require lower doses than usually prescribed for the other drug. Furthermore, whenever sertraline is withdrawn from co-use, an increased dose of the co-administered drug may be required.

Product 1996. Manufacturer's product information 2003.

Treatment of Bipolar Disorder

Treats the highs (mania)



Helps prevent the highs and lows (maintenance)

Helps manage the lows (depression)

Treatment Options for Bipolar Disorder

- Lithium
- Divalproex
- Lamotrigine
- Carbamazepine and other anticonvulsants
- Typical antipsychotics
 - Haloperidol
 - Chlorpromazine

- Atypical antipsychotics
 - Aripiprazole
 - Clozapine
 - Olanzapine
 - Quetiapine
 - Risperidone
 - Ziprasidone
 - Other atypicals
- Antidepressants

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Acute Mania: Aims of Treatment

- ♦ Acute tranquilization, sedation
- ♦ Improve manic symptoms
- ♦ Improve psychosis
- ♦ Improve depressive symptoms
- ♦ Avoid subsequent depression

Lithium



- ♦ Mechanism of action unknown
- ♦ Interacts with sodium and K+
- ♦ Alters electrical conductivity
 - potential threat to all body functions that are regulated by electrical currents
- ♦ Can cause polyuria and polydipsia due to Na and K alterations
- ♦ Has the lowest therapeutic index of all psych drugs
- ♦ Have to monitor blood levels of this drug

Lithium



- ♦ Maintenance blood levels of lithium are usually 0.4-1.3 mEq (toxicity occurs with levels > 1.5 mEq/L)
- ♦ Sign of toxicity is a fine intention tremor that becomes more pronounced and coarse.
- ♦ Risk of thyroid & kidney disease
- ♦ If toxic s/s occur discontinue the drug and notify health care provider
- ♦ Lithium should be taken with food
- ♦ Client must eat a balanced diet with normal sodium intake and take in adequate fluid (about 2-3 liters/day).
- ♦ Excretion is dependent on this.
- ♦ Dehydration and salt restriction can increase lithium levels & cause toxicity.
- ♦ Takes 2-3 weeks for lithium to become effective (may use antipsychotic until therapeutic levels are reached)

Signs & symptoms of lithium toxicity:

- Fine hand tremors that progress of coarse tremors
- Mild GI upset progressing to persistent upset
- Slurred speech and muscle weakness progressing to mental confusion
- **Severe Toxicity:**
 - decrease level of consciousness to stupor and finally coma
 - Seizures, severe hypotension, severe polyuria with dilute urine

Contraindications for Lithium:

- Renal disease
- Cardiac disease
- Severe dehydration
- Sodium depletion
- Brain damage
- Pregnancy or lactation
- Use with caution in the elderly or clients with diabetics, thyroid disorders, urinary retention, and seizures



WHY WE MIGHT CHOOSE THIS MEDICATION?

LITHIUM

Pros	Cons
<ul style="list-style-type: none"> • Gold standard treatment • Long term experienced & widely accepted on guidelines • Effective in both acute bipolar mania & depress • Very inexpensive 	<ul style="list-style-type: none"> • Suicidal risk is a concerns • Required closely monitoring serum lithium level • High risk of lithium toxicity • Risk of hypothyroidism



VALPROATE

Pros	Cons
<ul style="list-style-type: none"> • Widely accepted as 1st line in all updated guidelines • Strong efficacy in acute Bipolar mania • Probably prevent manic and depressive relapse • Rapid onset of action within 3-4 days • Wide spectrum of responders • Superior tolerability to LI 	<ul style="list-style-type: none"> • Limited value in Bipolar depression, particularly as monotherapy • Increased appetite and weight gain • Pregnancy concerned



LAMOTRIGINE

Pros	Cons
<ul style="list-style-type: none"> • Strongly accepted as 1st line in Bipolar Depression • Shown efficacy in rapid cycling 	<ul style="list-style-type: none"> • Slow escalation of dose essential • Rash: especially if dose escalation rapid, particularly if added to VPA



SEROQUEL

Pros	Cons
<ul style="list-style-type: none"> • Strong antidepressant effects • Effective in both Bipolar mania & depression • Prevents both manic and depressive relapse • Lower risk of diabetes & EPS than other AAPs 	<ul style="list-style-type: none"> • Risk of weight gain • High incidence of dry mouth • Expensive



ZYPREXA	
Pros	Cons

- Long term experienced
- Proven efficacy in Bipolar mania
- Largest increased on weight
- Diabetes risk

RISPERIDONE

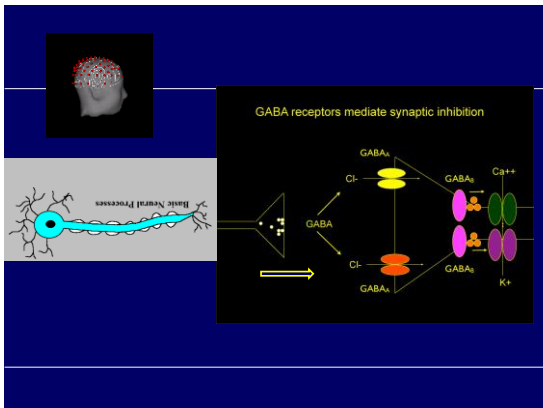
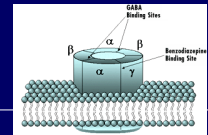
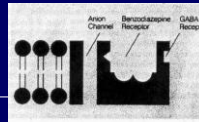
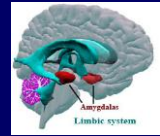
- Prevents only manic relapse
- No diabetes risk & change on cholesterol levels
- Can cause some muscle problems (EPS)
- EPS side effect limits how high one you can push the dose

ARIPRAZOLE

- Prevents only manic relapse
- No diabetes risk & change on cholesterol levels
- No efficacy in Bipolar depression

Biologic Basis of anxiety Disorder

- GABA Inhibitory neurotransmitter system
- GABA and benzodiazepine receptors complex



ข้อมูลทั่วไปของ benzodiazepine ชนิดต่างๆ

Drug	Dosage	rate absorb	half life	duration of action	dosage range
Alprazolam	0.25, 0.5, 1.0	medium	12	short	0.5-6
Chlordiazepoxide	5, 10, 25	medium	100	very long	15-100
Clonazepam	0.5, 2	medium	34	long	0.5-10
Clorazepate	5, 10	rapid	100	very long	7.5-60
Diazepam	2, 5, 10	rapid	100	very long	2-60
Flurazepam	15, 30	rapid	100	very long	15-30
Lorazepam	0.5, 1, 2	medium	15	short	2-6
Midazolam	15	rapid	2.5	very short	15
Oxazepam	15	slow	8	short	30-120
Prizepam	10	slow	100	very long	20-60
Temazepam	15, 30, 20	medium	11	short	15-30
Triazolam	0.125, 0.25	rapid	2	very short	0.125-0.25

Benzodiazepine Therapy Advantages

Efficacy

- Broad range of therapeutic choices
- Rapid onset of therapeutic action
- Safe
- Few adverse drug interactions
- Favorable sleep profile

Disadvantages of Benzodiazepines

- Potential for physiologic/psychologic dependency.
- Some potential for abuse.
- CNS side effects.
- Additive CNS depression.
- Active metabolites can accumulate in elderly or ill patients.

Principles of psychopharmacotherapy

1. Diagnostic assessment
2. Psychopharmacotherapy alone is insufficient
3. Phase of an illness
4. Risk-to-benefit ratio
5. Prior personal history of response
6. Target specific symptoms
7. Adverse effects assessment

Documentation of the psychiatric/mental health nurse



Problem-oriented recording (SOAPIE):

- ♦ Subjective data = information gathered from what the client, family, or other source has said or reported
- ♦ Objective data = information gathered by direct observation
- ♦ Assessment = nurse's interpretation of the subjective and objective data
- ♦ Plan = actions/treatment to be carried out
- ♦ Intervention = nursing actions actually carried out
- ♦ Evaluation = assessment of the problem following nursing interventions

Focus charting (DAR and AIR):

- ♦ Data = information that supports the focus or describes pertinent observations
 - ♦ Action = nursing actions that address the focus
 - ♦ Response = description of client's response to any part of the medical or nursing care
-
- ♦ Assessment = observations about the client
 - ♦ Intervention = nursing actions that address the observations
 - ♦ Response = client's response to actions